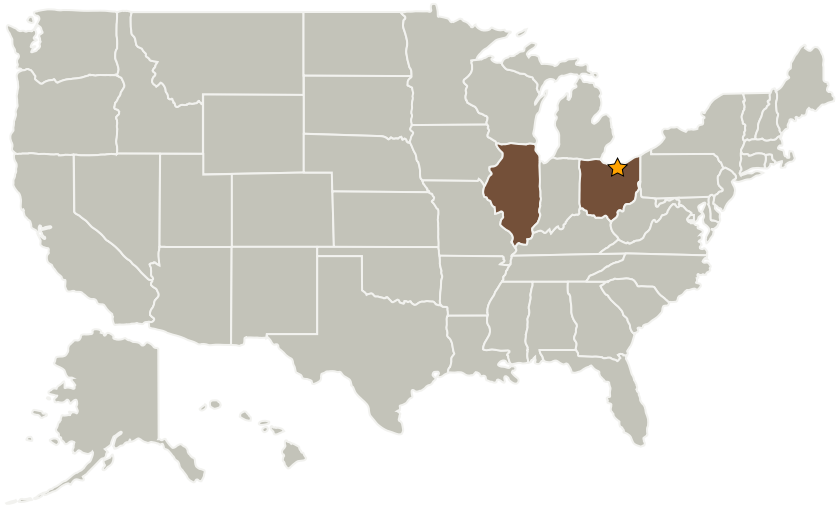
Demonstration of Fission Product Retention in a Novel NTR Fuel, Phase I

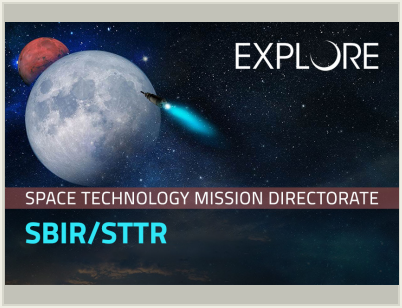
Completed Technology Project (2005 - 2005)

Project Introduction

Several studies over the past few decades have recognized the need for advanced propulsion to explore the solar system. As early as the 1960s, Werner Von Braun and others recognized the need for a nuclear rocket for sending humans to Mars. The great distances, the intense radiation levels, and the physiological response to zero-gravity all supported the concept of using a nuclear rocket to decrease mission time. These same needs have been recognized in later studies, especially in the Space Exploration Initiative in 1989. One of the key questions that has arisen in later studies, however, is the need to utilize a nuclear fuel form that does not emit fission products into the exhaust stream. Unlike the Rover/NERVA programs in the 1960s, the rocket exhaust in a current day nuclear rocket should contain no radioactivity. We will investigate a series of coated fuel forms that will inhibit fission products and actinides from diffusing out into the surrounding coolant. A demonstration experiment will be designed that will allow fuels containing uranium-238 to be fissioned, heated to very high temperatures, and assessed for emission of any products.

Primary U.S. Work Locations and Key Partners





Demonstration of Fission Product Retention in a Novel NTR Fuel, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

Demonstration of Fission Product Retention in a Novel NTR Fuel, Phase I

Completed Technology Project (2005 - 2005)

Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Hbar Technologies, LLC	Supporting Organization	Industry	West Chicago, Illinois

Primary U.S. Work Locations	
Illinois	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Gerald Jackson

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.4 Advanced Propulsion
    - TX01.4.3 Nuclear Thermal Propulsion